Fig. 1A

A - Top View

Fig. 1B

C - Side View Motor Up

Fig. 1C

B - Front View Motor Up

Fig. 1D

D - Side View Motor Down

Fig. 2A

Bottom View

Depth Limiter

Bit

0.2"

Fig. 2B

Side View On Carrier Material

Carrier Stock Metal

Depth Limiter

Fig. 3

Fig. 4

Fig. 5

Fig. 6A

Fig. 6B

Fig. 6C

Fig. 6D

Fig. 6E

Fig. 6F

Fig. 7

700

702

Fig. 8A   New Boxes

800

802

Fig. 8B   All Boxes

Fig. 9A   New Boxes

900

902

Fig. 9B   All Boxes
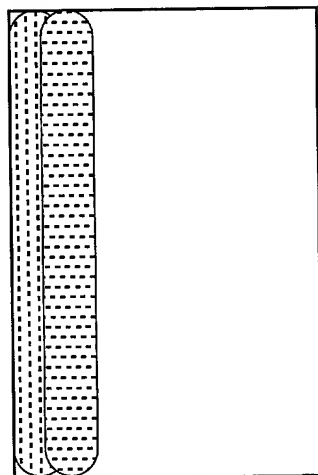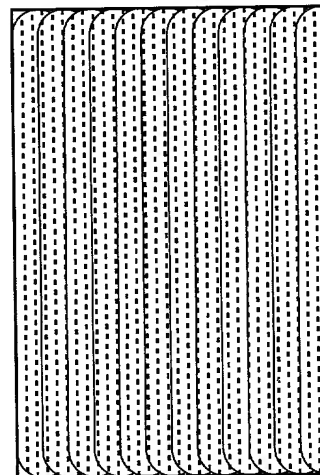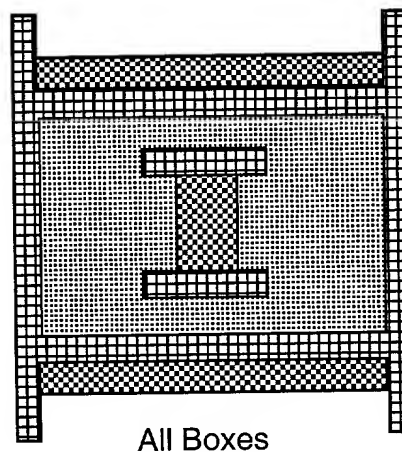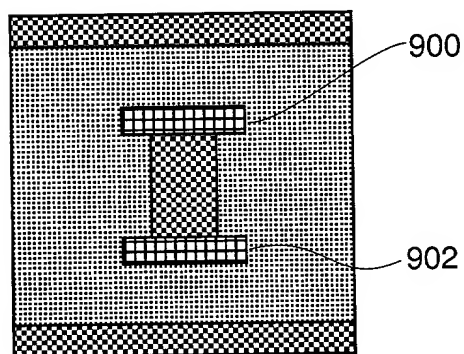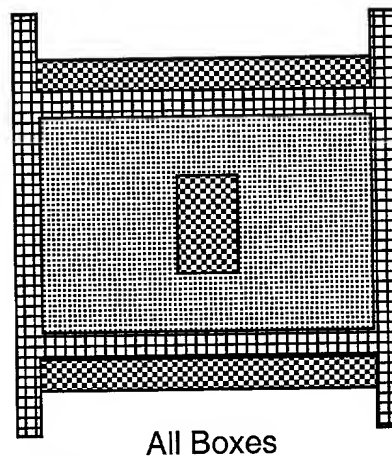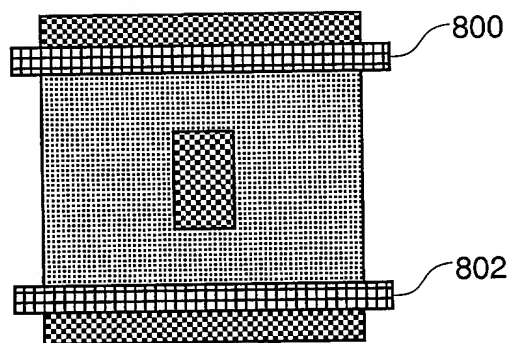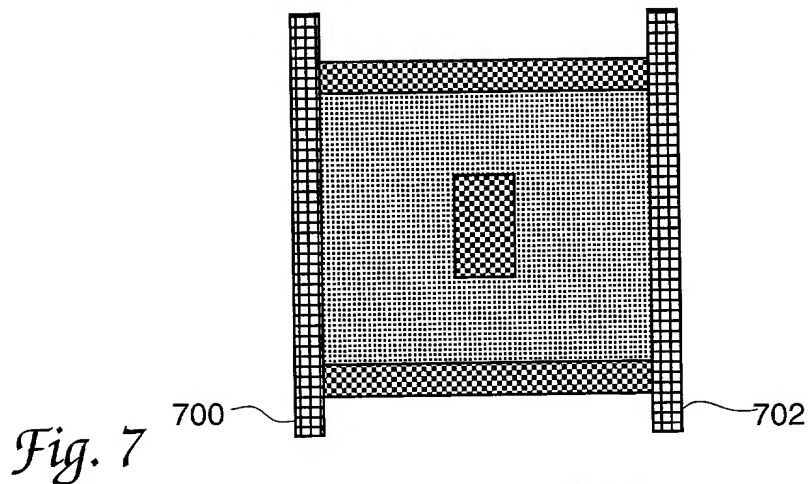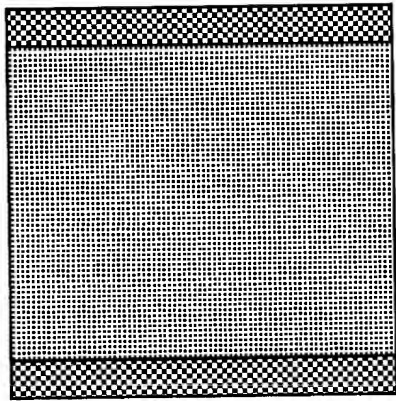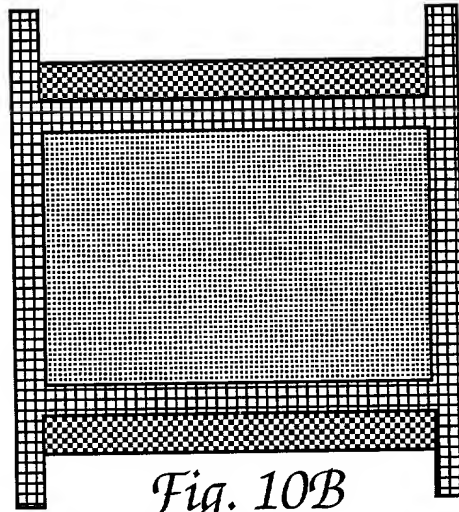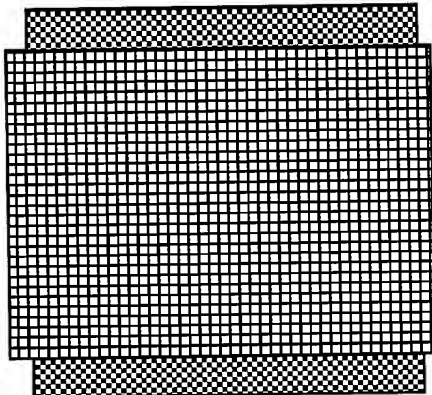
Fig. 10A
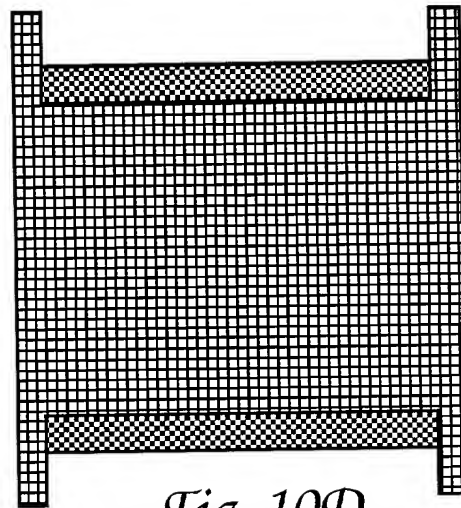
Fig. 10B

Fig. 10C

Fig. 10D
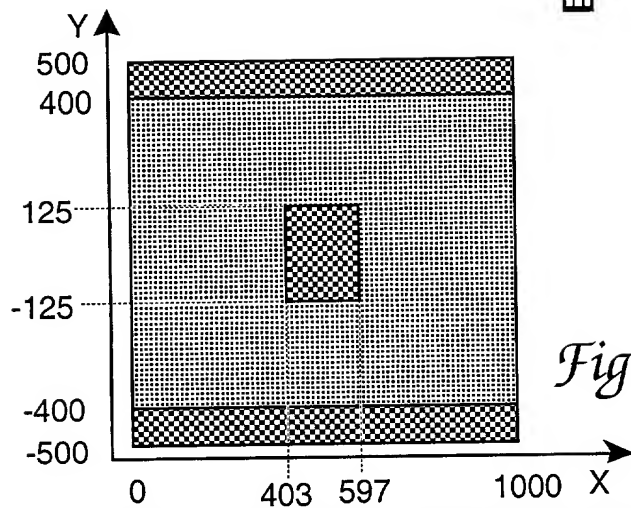
Fig. 11

Processing Boxes 1   Completed Boxes

		Completed Boxes
Xmin	0	Xmin
Ymin	-360.5	Ymin
Xmax	unknown	Xmax
Ymax	360.5	Ymax
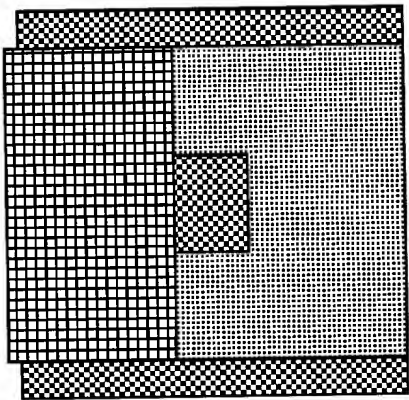
New Box

Processing Boxes 1   2
          Xmin   403   403
          Ymin   164.5   -360.5
          Xmax   unknown   unknown
          Ymax   360.5   -164.5

Fig. 12A
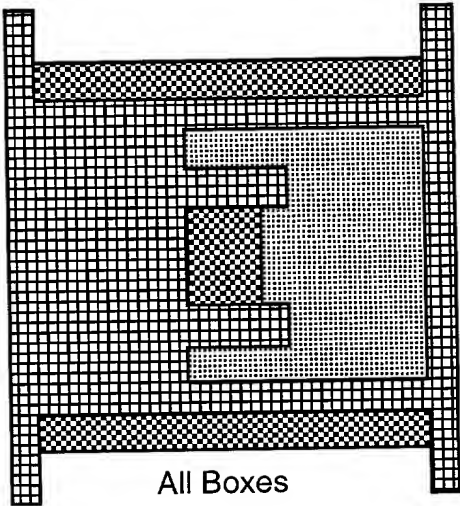
All Boxes

Completed Boxes 1
          Xmin   0
          Ymin   -360.5
          Xmax   363.5
          Ymax   360.5

Fig. 12B

New Boxes

Processing Boxes 1
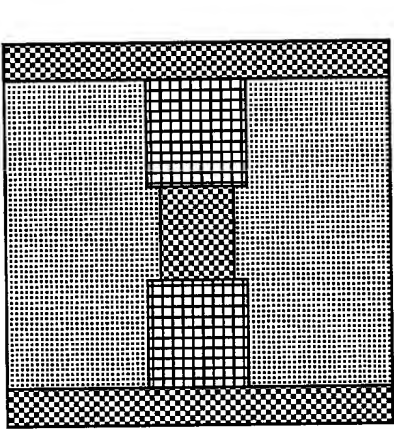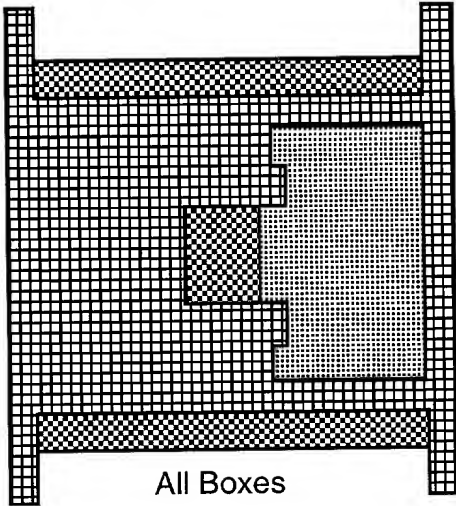|	
Xmin	636.5
Ymin	-360.5
Xmax	unknown
Ymax	360.5

Fig. 13A

All Boxes

Completed Boxes	1	2	3
Xmin	0	403	403
Ymin	-360.5	164.5	-360.5
Xmax	363.5	597	597
Ymax	360.5	360.5	-164.5

Fig. 13B

New Boxes

Processing Boxes
Xmin
Ymin
Xmax
Ymax

Fig. 14A
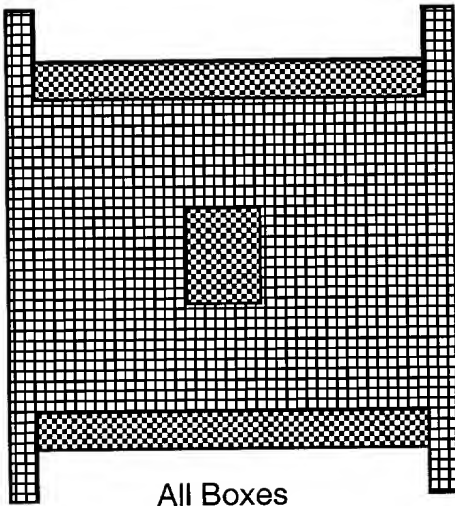
All Boxes

Completed Boxes	1	2	3	4
Xmin	0	403	403	636.5
Ymin	-360.5	164.5	-360.5	-360.5
Xmax	363.5	597	597	1000
Ymax	360.5	360.5	-164.5	360.5

Fig. 14B

Fig. 15

Original Carrier Layout

Fig. 16A

Cut Defined From Basic Algorithm

Fig. 16B

Processing Boxes 1
  Xmin 0
  Ymin -360.5
  Xmax
  Ymax 360.5

Completed Boxes
  Xmin
  Ymin
  Xmax
  Ymax

Fig. 17

New Box

Processing Boxes 1   2
        Xmin   403   403
        Ymin   96.5   -360.5
        Xmax
        Ymax   360.5   -108.5

Fig. 18A

All Boxes

Completed Boxes 1
        Xmin   0
        Ymin   -360.5
        Xmax   363.5
        Ymax   360.5

Fig. 18B

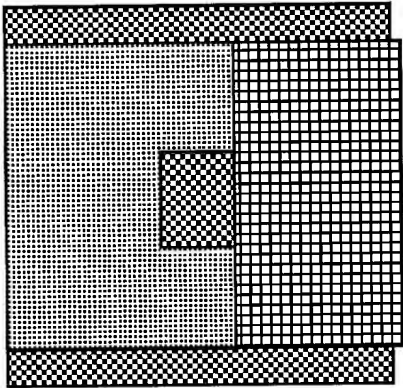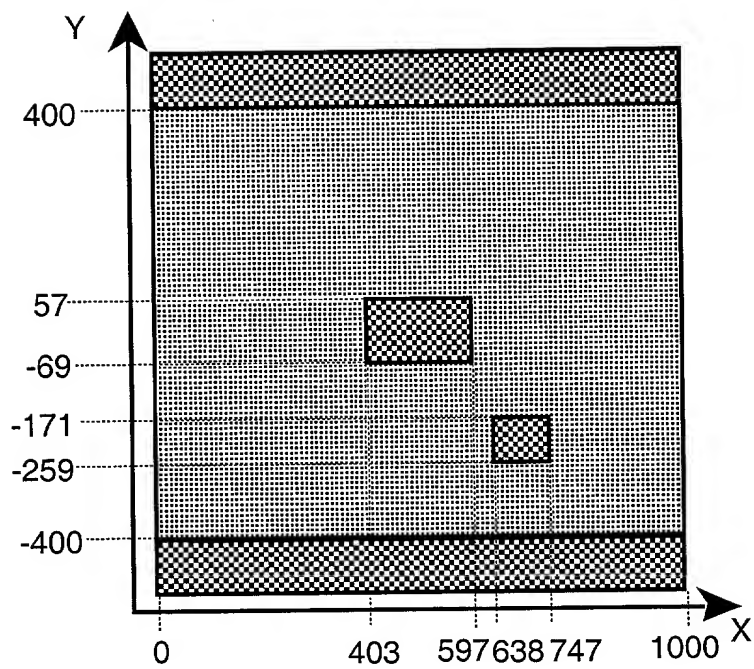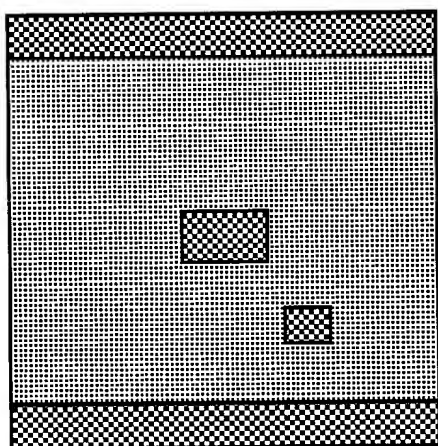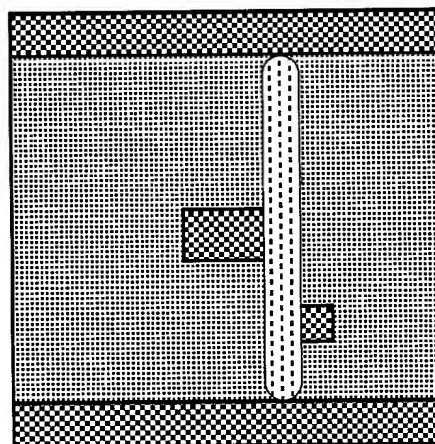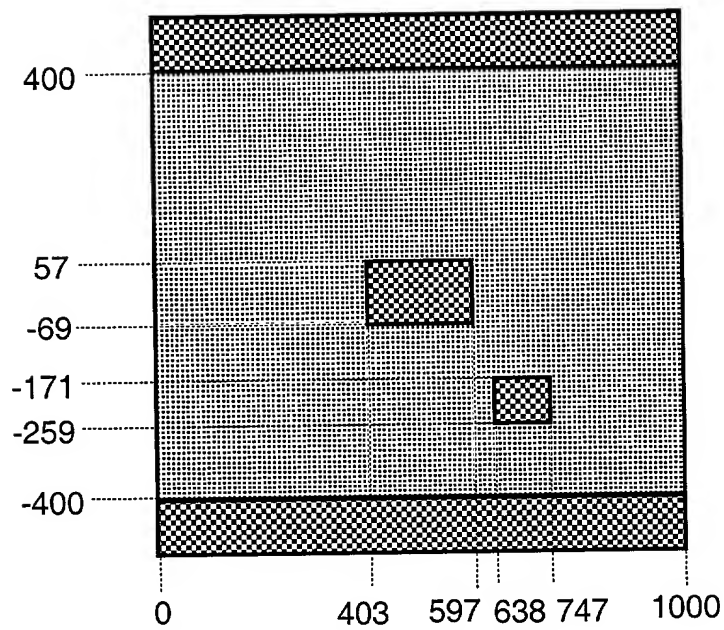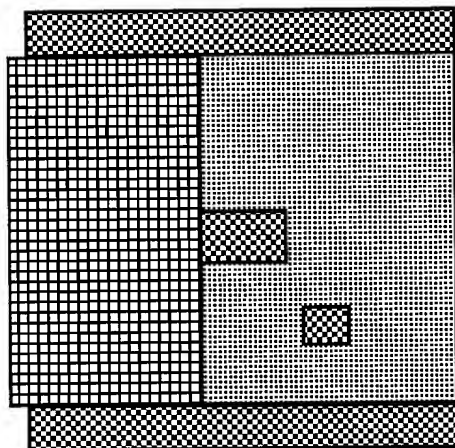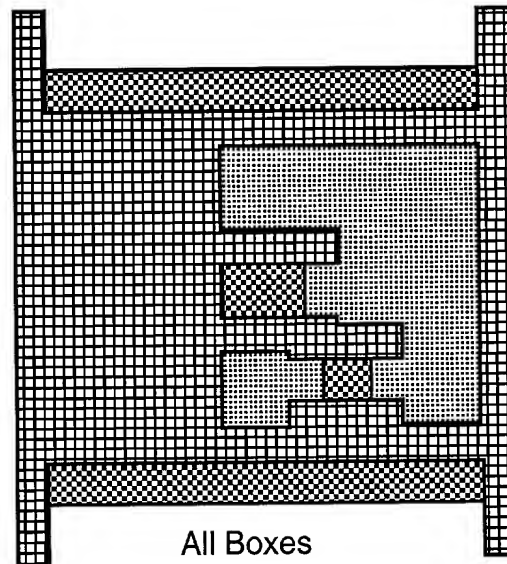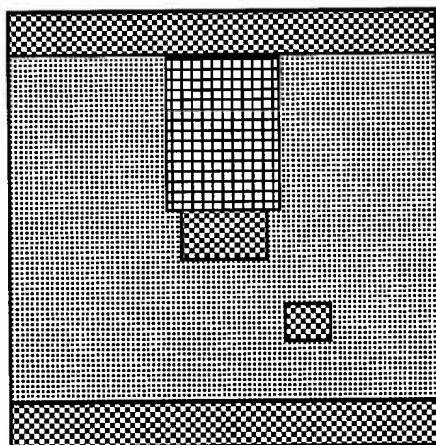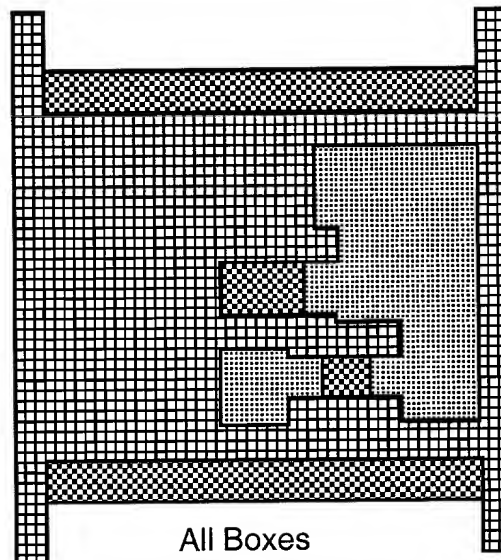New Box

Processing Boxes 1   2
        Xmin   403
        Ymin   -360.5
        Xmax
        Ymax   -108.5

Fig. 19A

All Boxes

Completed Boxes 1   2
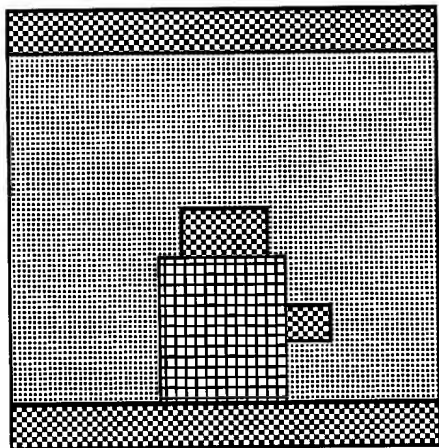   Xmin   0   403
        Ymin   -360.5   96.5
        Xmax   363.5   597
        Ymax   360.5   360.5

Fig. 19B

New Box

Processing Boxes
    Xmin
    Ymin
    Xmax
    Ymax
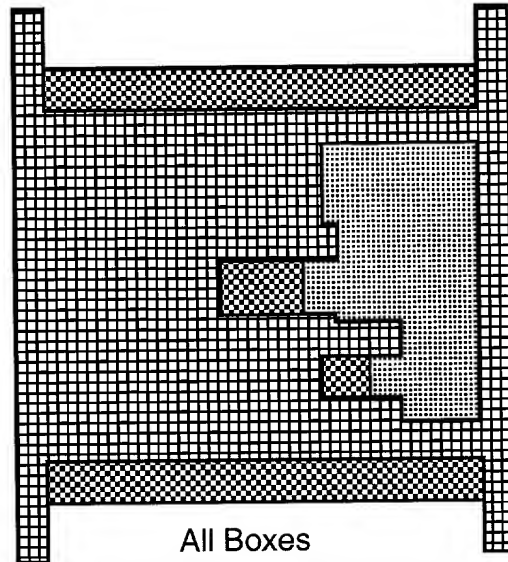
Fig. 20A

All Boxes

Completed Boxes	1	2	3
Xmin	0	403	403
Ymin	-360.5	96.5	-360.5
Xmax	363.5	597	598.5
Ymax	360.5	360.5	-108.5

Fig. 20B

New Box

Processing Boxes
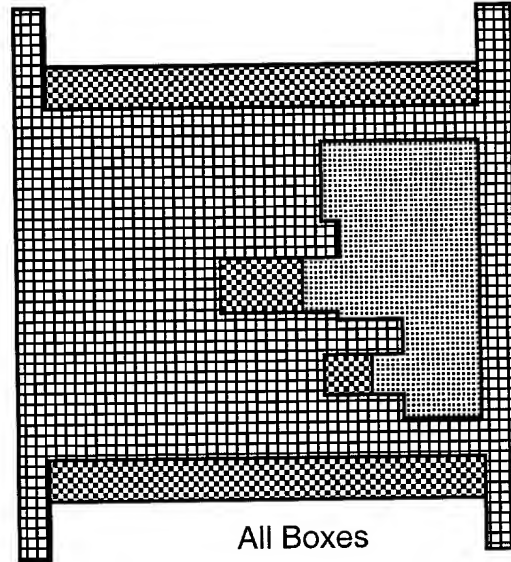
	Xmin
	Ymin
	Xmax
	Ymax

Fig .21A

All Boxes

Completed Boxes

	1	2	3	4
Xmin	0	403	403	620.5
Ymin	-360.5	96.5	-360.5	-131.5
Xmax	363.5	597	598.5	620.5
Ymax	360.5	360.5	-108.5	-108.5

Fig. 21B
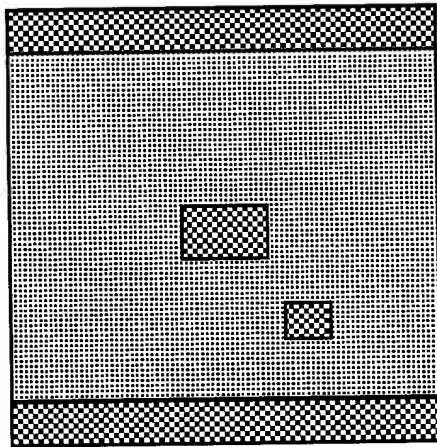
New Box

Processing Boxes

	1	2
Xmin	636.5	638
Ymin	-131.5	-360.5
Xmax		
Ymax	360.5	-298.5

Fig. 22A
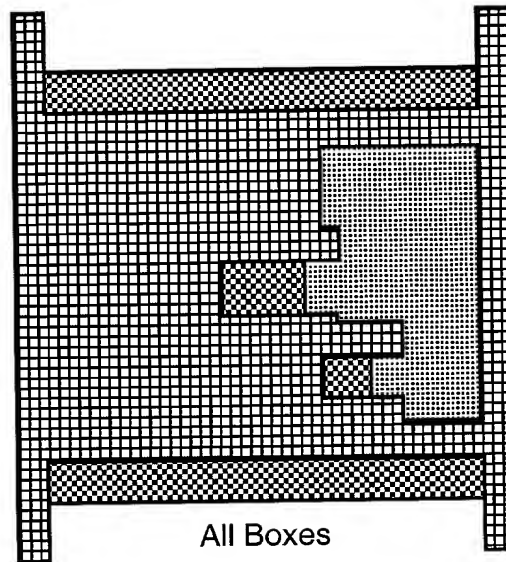
All Boxes

Completed Boxes

	1	2	3	4
Xmin	0	403	403	620.5
Ymin	-360.5	96.5	-360.5	-131.5
Xmax	363.5	597	598.5	620.5
Ymax	360.5	360.5	-108.5	-108.5

Fig. 22B
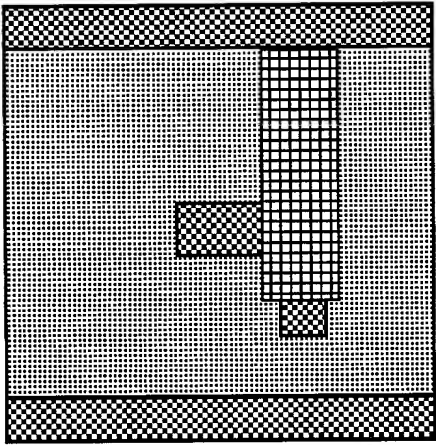
New Box

Processing Boxes 1

Xmin 638
Ymin -360.5
Xmax
Ymax -298.5

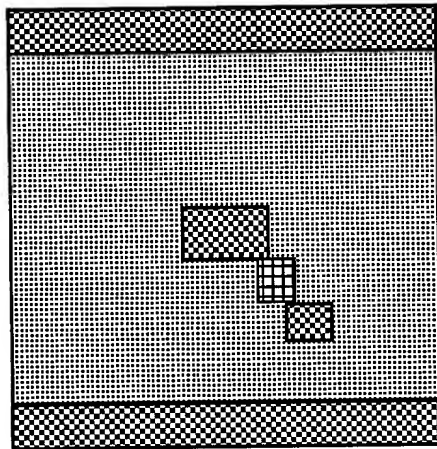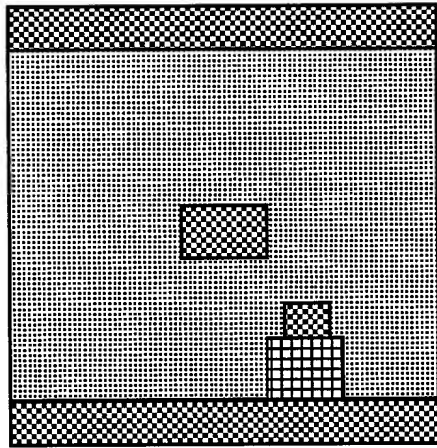*Fig. 23A*
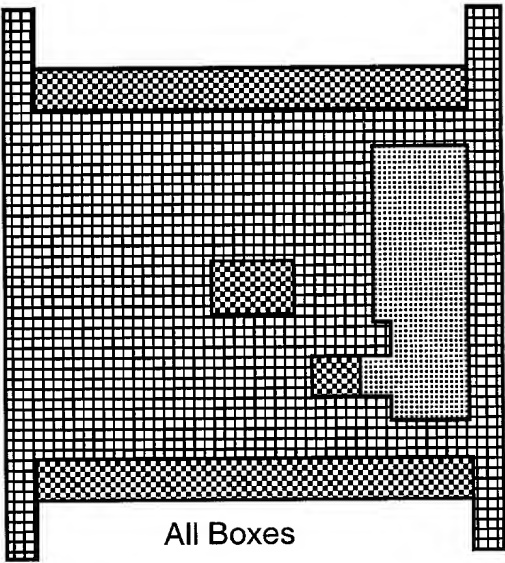
All Boxes

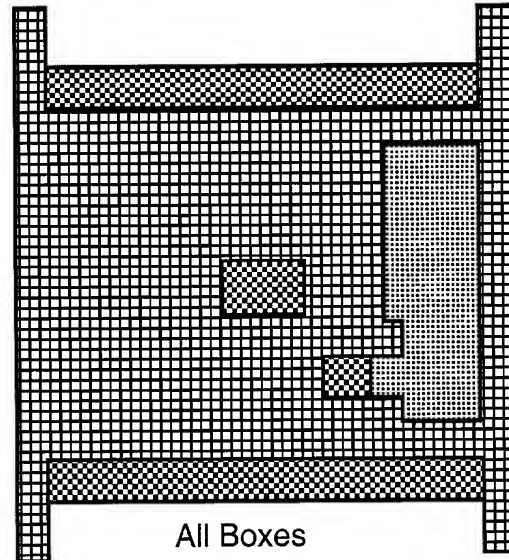| Completed Boxes 1	2	3	4	5
Xmin 0	403	403	620.5	636.5
Ymin -360.5	96.5	-360.5	-131.5	-131.5
Xmax 363.5	597	598.5	620.5	747
Ymax 360.5	360.5	-108.5	-108.5	360.5

Fig. 23B

New Box

Processing Boxes

Completed Boxes	1	2	3	4	5	6
Xmin	0	403	403	620.5	636.5	638
Ymin	-360.5	96.5	-360.5	-131.5	-131.5	-360.5
Xmax	363.5	597	598.5	620.5	747	747
Ymax	360.5	360.5	-108.5	-108.5	360.5	-131.5

Fig. 24A   *Fig. 24B*
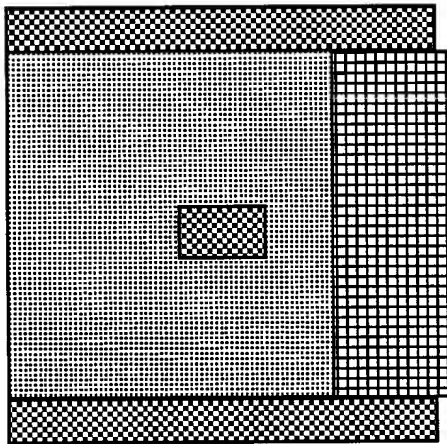
New Box
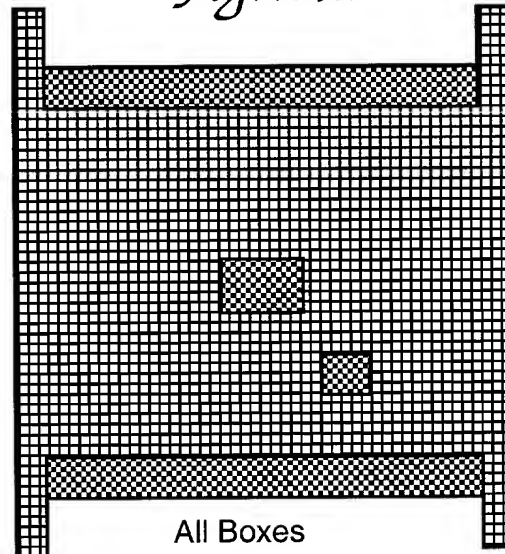
Processing Boxes

Completed Boxes	1	2	3	4	5	6	7
Xmin	0	403	403	620.5	636.5	636.5	786.5
Ymin	-360.5	96.5	-360.5	-131.5	-131.5	-360.5	-360.5
Xmax	363.5	597	598.5	620.5	747	747	1000
Ymax	360.5	360.5	-108.5	-108.5	360.5	-131.5	360.5

Fig. 25A   *Fig. 25B*

Bond
Wires

Substrate   Device   Substrate

2600   Cross Section

Fig. 26A

PRIOR ART

Copper   Device

Substrate
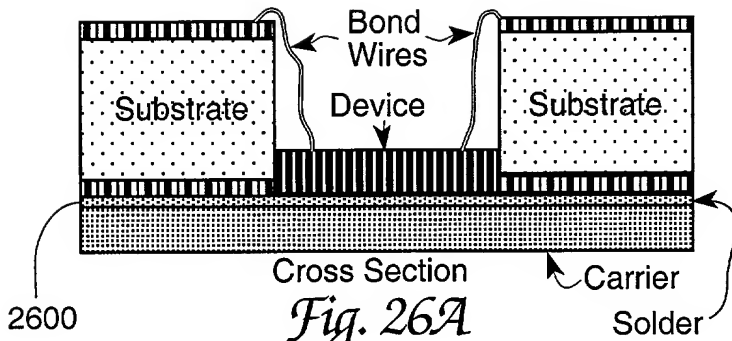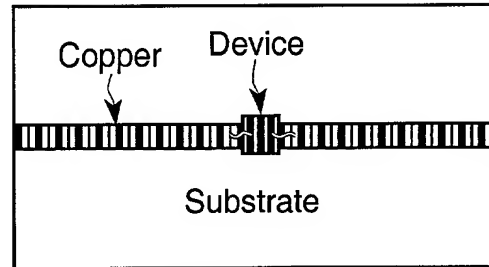
Top View

Fig. 26B

PRIOR ART

Bond
Wires   Copper

Substrate   Substrate

Cross Section   Carrier
Solder

Fig. 27A

Copper   Substrate

Device   Pedestal

Top View

Fig. 27B

Copper   Copper
Bond
Wires   Bond
Wires

Substrate   Filled Via   Substrate

Cross Section   Carrier
Solder

Fig. 28A

PRIOR ART

Copper   Device

Substrate
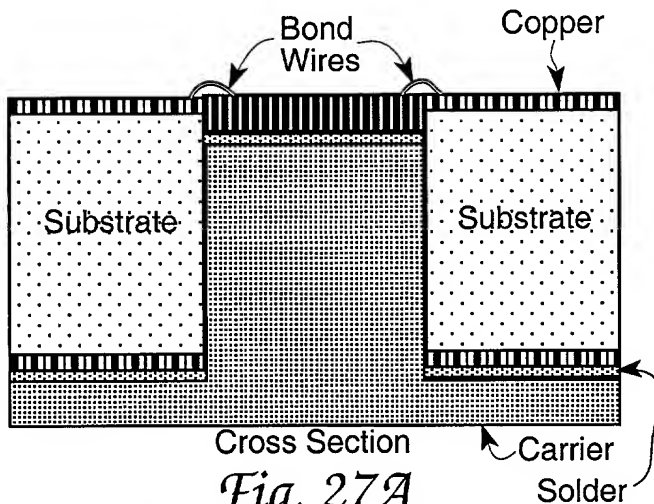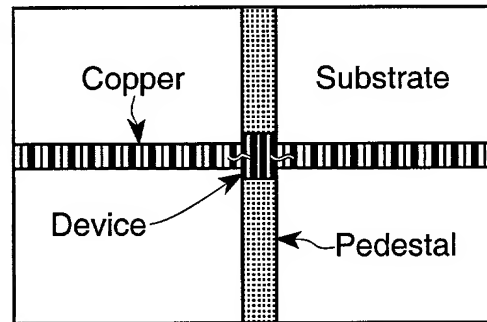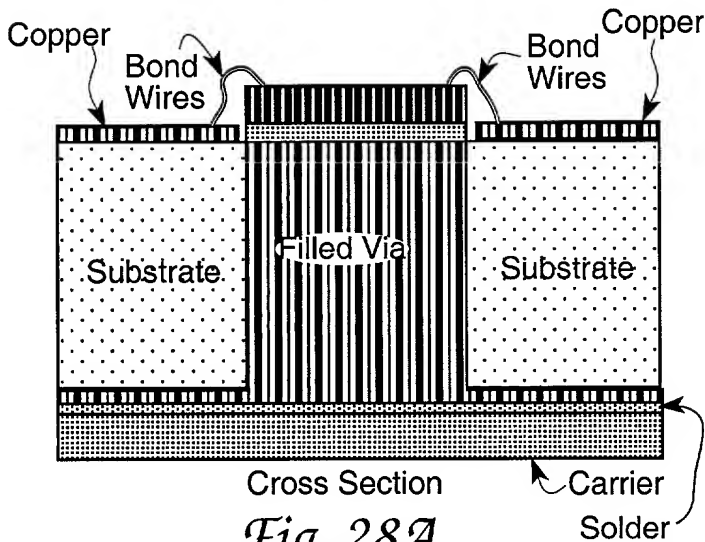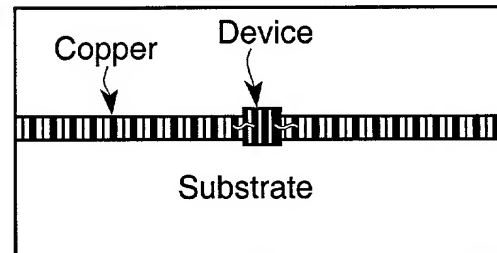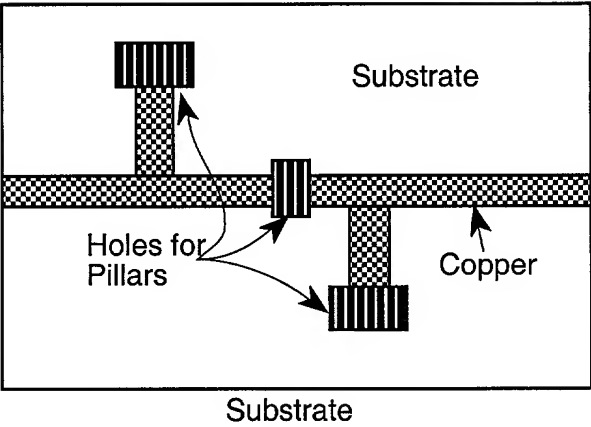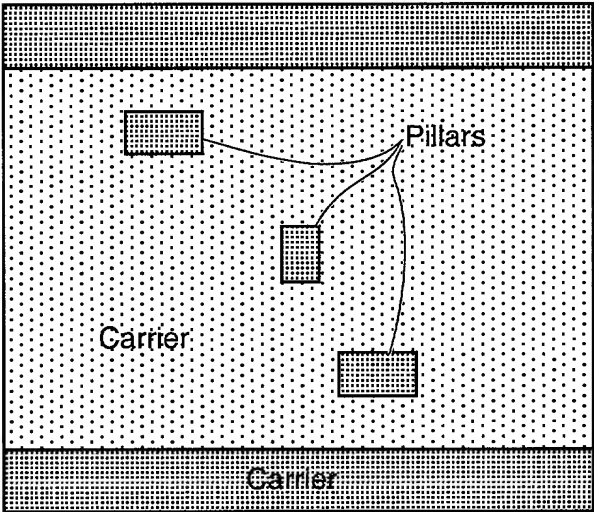
Top View

Fig. 28B

PRIOR ART

Fig. 30A

Fig. 30B

Fig. 30C

Fig. 29

Chip
Component

Bond
Wire

Copper

PRIOR ART

Substrate

Solder

Fig. 31A

Traditional Chip Attachment

3100

Chip
Component

Copper

Pillar

Substrate

Solder

Fig. 31B

Carrier

New Chip Attachment

Microwave
office

Other
GDSII editor

UCCAS

LPKF
software

technology file

Fig. 32